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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/549,381

06/30/2006

Jerry L Hahnfeld

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Intellectual Property Section
P.O. Box 1967
Midland, MI 48641-1967

EXAMINER

HEINCER, LIAM J

ART UNIT

PAPER NUMBER

1796

MAIL DATE

DELIVERY MODE

12/19/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/549,381	Applicant(s) HAHNFELD ET AL.	
	Examiner Liam J. Heincer	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

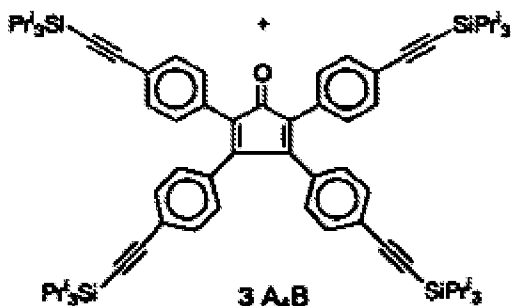
The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Mullen et al. (Chem. Commun., 1998, 1139-1140).

Considering Claim 1: Mullen et al. teaches a compound of the formula



/a compound comprising a single ring structure and leaving group, and three or more dienophile groups (page 1139).

Considering Claim 6: Mullen et al. teaches an oligomer made from the monomer (scheme 1).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2, 3, and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mullen et al. (Chem. Commun., 1998, 1139-1140) as applied to claim 1 above, and further in view of Godschalx et al. (US Pat. 5,965,679).

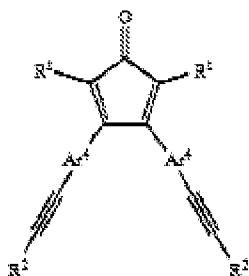
Considering Claims 2, 3, and 5: Mullen et al. teaches the compound of claim 1 as shown above.

Mullen et al. does not teach the compounds as having phenylacetylene terminal groups. However, Godschalx et al. teaches using phenylethynyl groups at the terminals of a polymerizable compound/thus giving 2,3,4,5-tetrakis-(4-phenylethynylphenyl)-2,4-cyclopentadienone (Table 1, E). Mullen et al. and Godschalx et al. are analogous art as they are concerned with the same field of endeavor, namely polymerizable cyclopentadienone compounds. It would have been obvious to a person having ordinary skill in the art at the time of invention to have used phenylethynyl terminal groups in the compound of Mullen et al. as in Godschalx et al., and the motivation to do so would have been, as Godschalx et al. suggests, they are readily polymerizable (2:18-24), while Mullen et al. requires an extra reaction step to remove the end groups (page 1139).

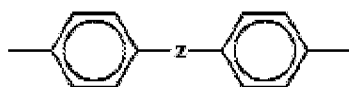
Note: The rejection below of claims 1-3, 5, and 6 is being presented as an alternative to the rejection of claims 1-3, 5, and 6 above to address limitations in the dependent claims.

Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Godschalx et al. (US Pat. 5,965,679) in view of Mullen et al. (Chem. Commun., 1998, 1139-1140).

Considering Claims 1-3: Godschalx et al. teaches a compound of the formula



where R¹ and R² are phenyl groups, and Ar⁴ can be a phenyl group (Table 1, E) or an inertly substituted aromatic moiety (9:49-50) such as



, (5:55) where Z is an oxygen atom (7:28-29).

Godschalx et al. does not teach the end units as having multiple phenylethynyl groups. However, Mullen et al. teaches a compound with two or more diaryl substituted acetylene moieties at the terminals (¶0005). Godschalx et al. and Mullen et al. are analogous art as they are concerned with the same field of endeavor, namely polymerizable cyclopentadienone compounds. It would have been obvious to a person having ordinary skill in the art at the time of invention to have used for than two functionalities on the terminal groups of the compound of Godschalx et al. as in Mullen et al., and the motivation to do so would have been, as Mullen et al. suggests, to the higher functionality leads to a much higher benzene density in the polymer, giving good solubility to the polymer (pg. 1140).

Considering Claim 6: Godschalx et al. teaches a composition comprising the monomers (13:45-56).

Considering Claims 7 and 8: Godschalx et al. teaches an insulating film for an electronic device (14:58-61) formed by solvent casting the composition, followed by solvent evaporation and curing (14:48-57).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Godschalx et al. (US Pat. 5,965,679) in view of Mullen et al. (Chem. Commun., 1998, 1139-1140) as applied to claim 1 above, and further in view of the evidence Mullen et al. (Chem. Rev. 1999, 1747-1785).

Considering Claim 4: Godschalx et al. and Mullen et al. collectively teach the compound of claim 1 as shown above.

Godschalx et al. does not teach placing the phenylethynyl groups on the same aromatic ring. However, as shown by Mullen et al. (Chem Rev), the shape of the building block monomer affects the shape, density and molecular weight of the dendritic product (pg. 1767). As there is a finite number of locations for the phenyl ethyl substituents in a tetraphenylcyclopentadienone, a person having ordinary skill in the art at the time of invention would have found it to be obvious to try placing the additional phenylethynyl groups on same aromatic group, and the motivation to do so would have been, as Mullen et al. (Chem Rev) suggests, to control the shape and density of phenylene oligomer. See MPEP § 2143.

Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Godschalx et al. (US Pat. 5,965,679) in view of Mullen et al. (Chem. Commun., 1998, 1139-1140) as applied to claim 6 above, and further in view of Godschalx et al. (US Pat. 6,359,091).

Considering Claims 9 and 10: Godschalx et al. and Mullen et al. collectively teach the composition of claim 6 as shown above.

Godschalx et al. does not teach adding a pore forming material to the composition. However, Godschalx et al. '091 teaches adding a poragen/pore forming material to a polyarylene prepolymer, removing the solvent, curing the oligomer, then removing the poragen (2:57-67). Godschalx et al. and Godschalx et al. '091 are analogous art as they are concerned with the same field of endeavor, namely polyarylene polymers. It would have been obvious to a person having ordinary skill in the art at the time of invention to have used the poragen of Godschalx et al. '091 in

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Godschalx et al. and the motivation to do so would have been, as Godschalx et al. '091 suggests to lower the dielectric constant of the film (1:10-12).

Considering Claims 11: Godschalx et al. teaches an insulating film for an electronic device (14:58-61).

Response to Arguments

Applicant's arguments filed October 22, 2008 have been fully considered but they are not persuasive, because:

Applicant's argument that Mullen et al. does not teach a reactive ethynyl group is not persuasive. Absent a specific definition in the specification, claims are to be given their broadest reasonable interpretation. See MPEP § 2111. As there is nothing in the original specification to limit the limitation "under cycloaddition reaction conditions" to any specific conditions, the conditions are not being interpreted as excluding the deprotecting sequence of Mullen et al. Mullen et al. teaches that after this sequence the ethynyl groups will react with diene groups of the original monomer (11339). Thus, the ethynyl groups of Mullen et al. meet the claim limitations.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Liam J. Heincer whose telephone number is 571-270-3297. The examiner can normally be reached on Monday thru Friday 7:30 to 5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on 571-272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark Eashoo/

Supervisory Patent Examiner, Art Unit 1796

LJH

December 16, 2008